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MEMORANDUM

TO:	Greg Carli	REF. NO.:	056393
FROM:	Aaron Stadnyk/Hassan Gilani/cs/3	DATE:	May 12, 2010
CC:	Rick Heokstra, Jodie Dembowske, Pete Lewis, Renee Pionk		
RE:	**Proctor Test Results - Remedial Action** **12th Street Landfill Operable Unit No. 4** **Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site** **Allegan and Kalamazoo County**		

The following memorandum has been prepared to document the results of the Proctor Tests that were performed at the 12th Landfill Operable Unit No. 4 of the Allied Paper/Portage Creek/Kalamazoo River Superfund Site (Site). The following was prepared in consultation with Inspec-Sol.

In order to determine the moisture-density relationships of the on-Site materials for compaction control, standard Proctor tests were carried out in accordance with the ASTM Standard D 698 on the following three on-site samples:

1. Fly Ash obtained from the berm of the existing landfill - initial (in-situ) moisture content 37 percent
2. Paper sludge material obtained from the Asphalt Plant Property area - in-situ moisture content 136 percent
3. Same sample as #2 (paper sludge) modified by addition of 2 percent Portland Cement and 6 percent common fill - initial moisture content after modification 97 percent

The first test performed on Sample 1 - Fly Ash was carried out using the normal testing procedure, involving adding moisture to the material for each stage of the test until a suitable curve showing maximum dry density (MDD) and optimum moisture content (OMC) values of 48.4 pounds per cubic foot (pcf) and 55 percent respectively were obtained.

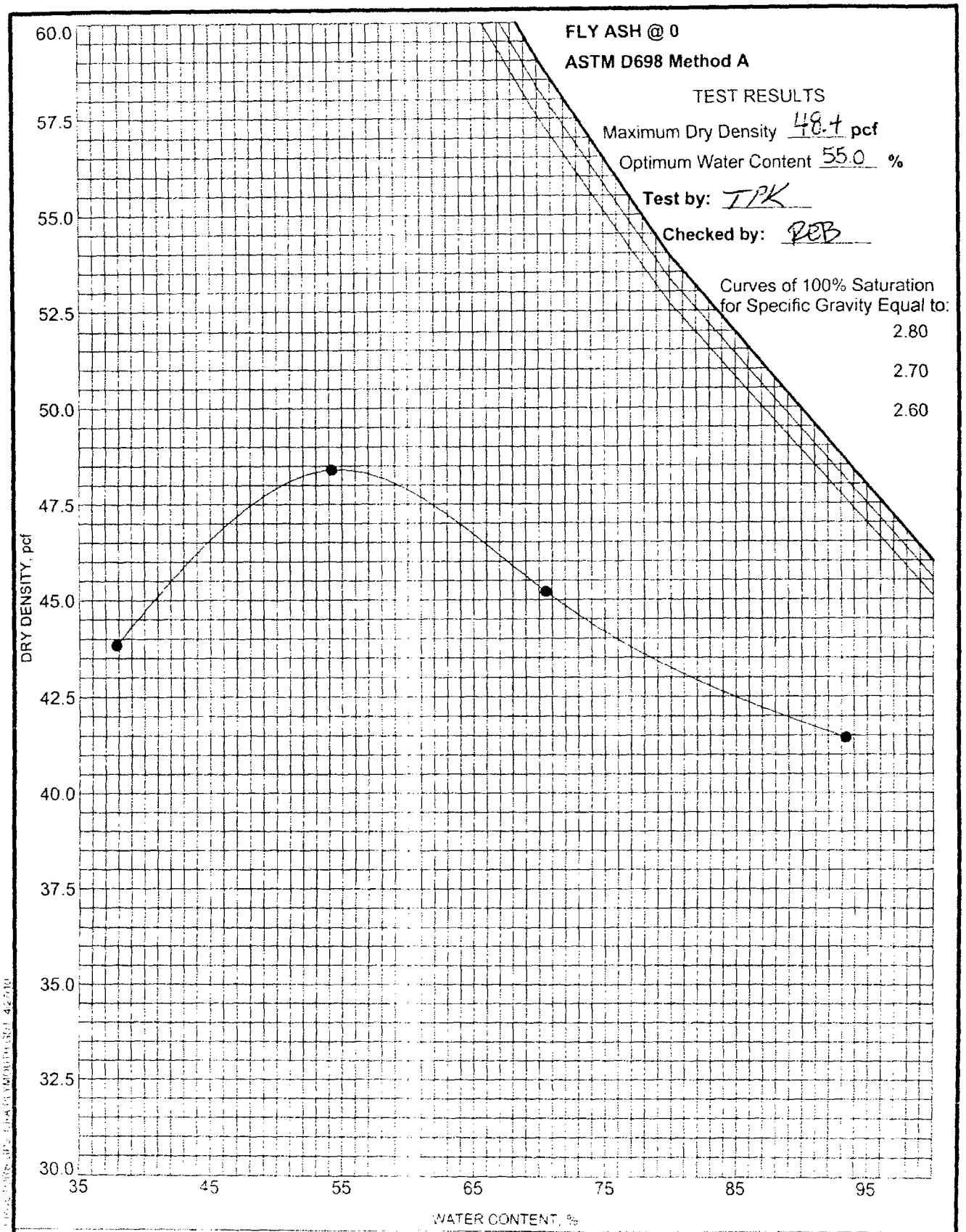
For Samples 2 and 3, the normal testing procedure was modified to determine the moisture-density relationship of paper sludge and modified paper sludge materials. The materials were air dried for each stage of the respective Proctor tests from the high (in-situ or initial) to lower moisture values. The materials thus air dried were then compacted using Method A of ASTM D698. For paper sludge material the MDD is 56.5 pcf and the OMC is 60 percent. For the modified paper sludge material the MDD is 57.8 pcf and the OMC is 38 percent.

The Proctor Test results are provided in Attachment A. It is noted here that for the paper sludge and modified paper sludge materials, it typically took one to two days of air-drying for each stage of 20 to 30 percent reduction in the moisture content.

A review of the above described test procedure shows that addition of modifying agents did not increase the MDD significantly nor reduced the overall test time, therefore, paper sludge material without additives can be used.

ATTACHMENT A

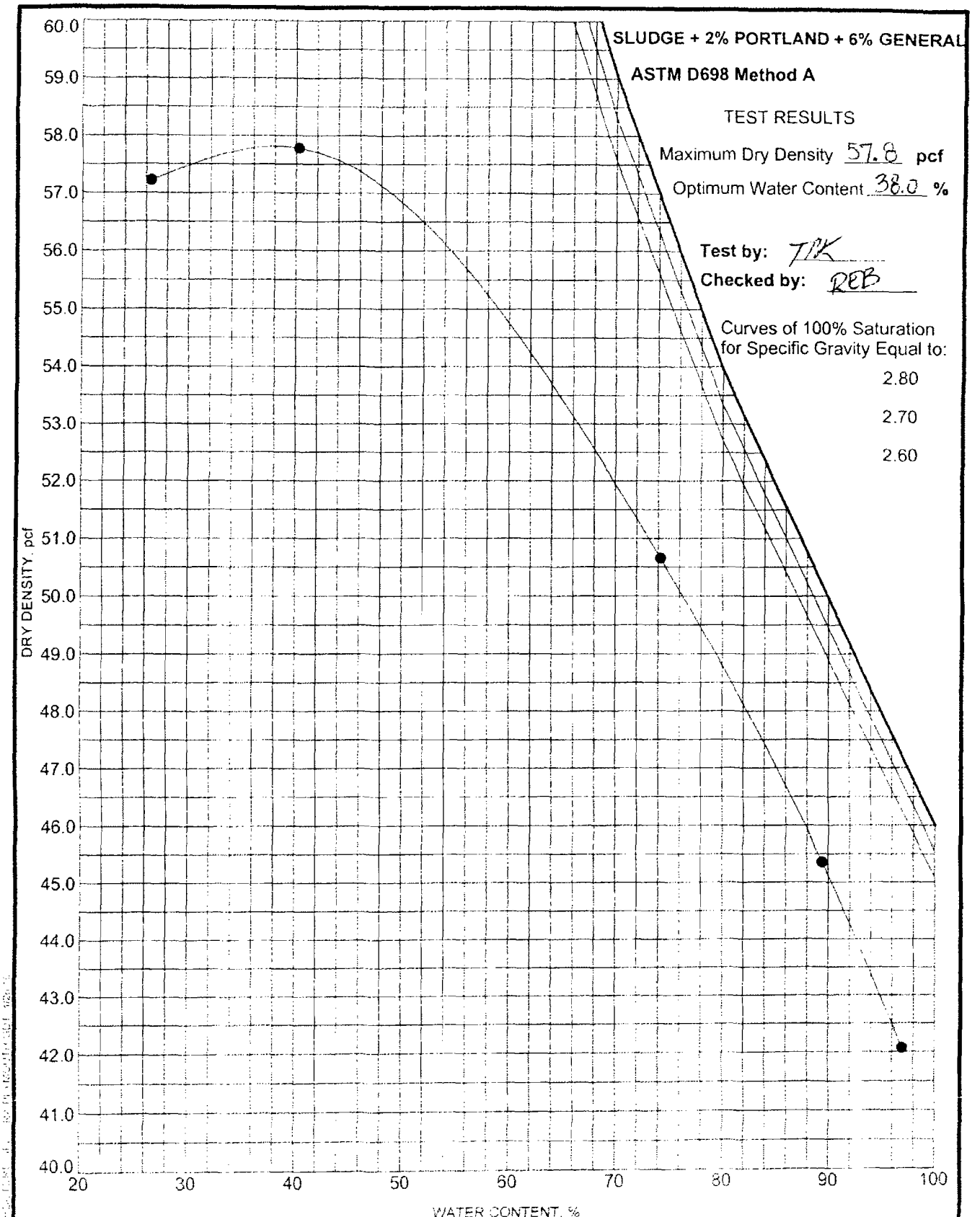
PROCTOR TEST RESULTS



INSPECSOL ENGINEERING INC.

MOISTURE-DENSITY RELATIONSHIP

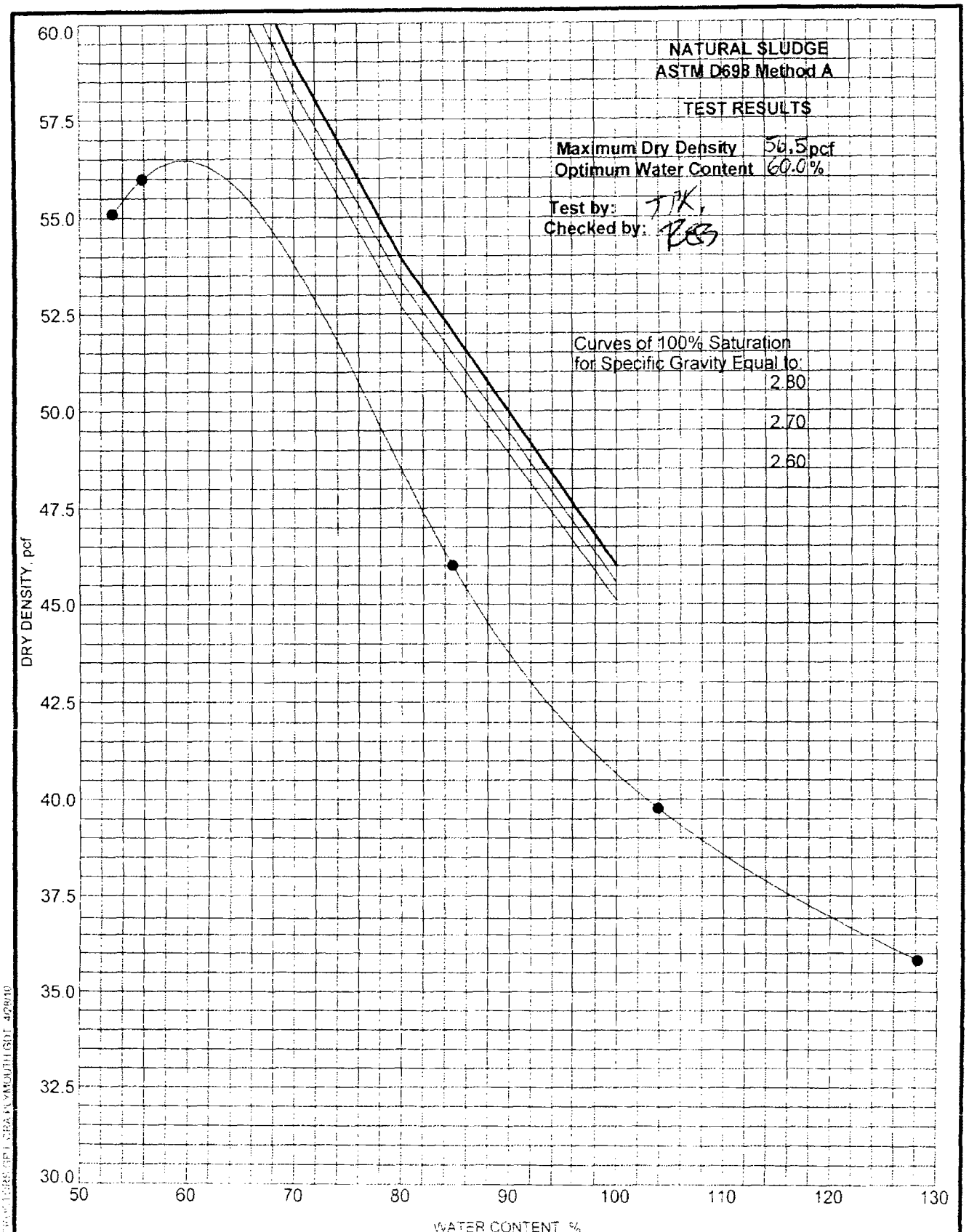
Project Name: 12th Street Landfill
Project Number: 56393-07-002
Client: Weyerhauser
Location: Ostego, MI



MOISTURE-DENSITY RELATIONSHIP

INSPECSOL ENGINEERING INC.
MEMBER OF THE TRAMPER OIL COMPANIES

Project Name: 12th Street Landfill
Project Number 56393-07 002
Client: Weyerhauser
Location: Ostego, MI



INSPECSOL
ENGINEERING INC.

MOISTURE-DENSITY RELATIONSHIP

Project Name: 12th Street Landfill
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Client: Weyerhauser
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